

REMARKS

The Examiner's final Office Action dated March 18, 2008 has been received and carefully considered. In conformance with the applicable statutory requirements, this paper constitutes a complete reply and/or a bona fide attempt to advance the application to allowance. Reexamination and/or reconsideration of the application as amended are respectfully requested.

Summary of the Office Action

Claims 1-5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoneda (U.S. Patent No. 4,614,645) in view of Monro (U.S. Patent No. 5,044,424).

The Subject Application

As amended, the subject application relates to economically providing an exhaust smoke processing system in which the mercury concentration in exhaust smoke discharged from a smoke stack is reduced. Even if coal is burned or the temperature of exhaust smoke at the inlet of a heat recoverer is varied, the mercury concentration in the exhaust gas discharged into the atmosphere can fall within a predetermined range (page 4, lines 4-8, page 15, lines 22-25, examples, tables 1-4).

Primary Reference of Record: Yoneda et al.

The Examiner's primary reference continues to be Yoneda et al. (U.S. Patent No. 4,614,645), which discloses a method for treating an effluent in an exhaust gas treating apparatus. With reference to Figure 2 reproduced below, Yoneda et al. specifically discloses a cleaned exhaust gas 9 being sent from an absorption tower to a gas-gas heater 33 wherein the exhaust gas 9 is again heated. Specifically, the cleaned exhaust gas 9 is returned from absorption tower 8 to the gas-gas heater and it heated thereagain, and it is then discharged into the atmosphere through chimney 30. *See col. 4, lines 52+*. This is contrary to the assertion advanced by the Examiner wherein the Examiner indicates that Yoneda teaches "a heat medium circulation pipe passage (9)."

**The Claims Distinguish Patentably
Over the Reference(s) of Record**

The Applicants have amended claim 1. Amended Claim 1 is defined by, among other, an element that controls mercury emission. Specifically, a heat medium circulation pipe passage is provided with temperature control means which measures the mercury concentration in exhaust smoke discharged from any one or more of a dust collector, a wet-type exhaust smoke processing apparatus, and a reheater, and adjusts the temperature of the exhaust smoke at an outlet of the heat recoverer such that the mercury concentration falls within a predetermined range.

First, the Applicants respectfully submit that Yoneda et al. and Monro, separately or in combination, fail to teach or suggest the use of a heat medium circulation pipe passage.

Yoneda discloses when the effluent is drawn out from the cooling tower 6 and neutralized in the neutralizing tank 25, it is then sprayed into the exhaust gas in evaporator 27 so that the concentration of the suspended material may be within the range of 1 to 5 wt-%. Spraying will be carried out in an amount of the effluent proportion to a flow rate of the exhaust gas. The amount of the effluent will increase as the flow rate of the exhaust gas increases. The result will be that the droplets are evaporated and dried effectively. Thus, the amount of the deposit will be reduced, and the deposit accumulation preventing device can therefore be omitted (col. 3, line 65 to col. 4, line 14). Yoneda further discloses since the amount of the effluent sprayed into the exhaust gas increases or decreases in compliance with the flow rate of the exhaust gas as described previously, a temperature drop of the exhaust resulting from the spray of the effluent will be constant (column 4, lines 14 to 19).

According to the above described system disclosed by Yoneda, it is impossible to decrease the temperature of the exhaust gas fed to the cooling tower 6 (or a wet-type exhaust smoke processing apparatus) positively or excessively so that the exhaust smoke discharged from the system has a predetermined low concentration of mercury (Detailed Description, Example 1 and Table 1). Therefore, in the instant claims 1 and 2,

a reheater 13 is indispensable whereas in Yoneda a reheater is not required. Similarly, the instant claims 1 and 2, it is necessary to provide a heat medium circulation pipe passage for circulating the heat medium between the reheater 13 and the heat recoverer 11 which includes a temperature control means which controls positively the temperature of the heat medium.

Second, Yoneda and Monro each fail to teach or suggest inherently or expressly the element that controls mercury emission. Both references fail to teach or suggest devices for decreasing or controlling the mercury concentration in, for example, the exhaust gas discharged from a wet exhaust gas treating device. For example, Table 1 in Yoneda discloses the properties of the exhaust gas from the pilot plant, in which concentration of mercury is not mentioned at all. Also, in Tables 2-4, Yoneda fails to teach or suggest inherently or expressly the concentration of heavy metal in the cooling liquid or solution, or the filtrate.

Third, Yoneda explicitly teaches away from the element that controls mercury emissions. Yoneda only discloses measuring a concentration of suspended dust material in an effluent from the wet exhaust gas treating device and the amount of said effluent is adjusted such that the concentration of suspended dust material becomes 1-5 wt%. *See column 3, line 54 to column 4, line 6 in Yoneda.* According to the device disclosed in Yoneda, it is impossible to decrease the mercury concentration in exhaust gas discharged from a smoke stack.

Fourth, and most importantly, Yoneda and Monro fail to teach or suggest the temperature adjustment means. There is no means for controlling the flow rate of the cleaned exhaust gas. The temperature of the exhaust gas is left to the flow amount in a temperature of an exhaust gas flowing into the system. The temperature of the exhaust gas in an outlet of the absorption tower 8 is 50-48°C, and temperature of the exhaust gas in an outlet of the gas-gas heater 33 is 90-80°C. *See column 7, lines 39-41 of Yoneda.*

In addition, the Examiner tacitly concedes that Yoneda fails to teach a preheater that has gas-gas heat exchange with gas going back into a boiler. This concession is

evidenced by the Examiner's continuing reliance on the addition of Monro to Yoneda to reject the pending claims. The Examiner's statement that Yoneda "possibly" does not teach a preheater that has gas-gas heat exchange with gas going back into the boiler is taken by Applicant to be a concession that Yoneda does not teach this limitation. In adding Monro to Yoneda, the Examiner alleges that it would have been obvious to a person of ordinary skill in the art to have modified the exhaust smoke processing system of Yoneda in view of the teachings of Monro "in order to for [sic] improving the efficiency of such heat generators and for better utilization of heat produced in the thermal section." The Examiner cites column 1, lines 22-26 of Monro for this proposition.

The Applicants respectfully submit that this is an invalid reason for supporting the combination of Monroe and Yoneda. More particularly, the Examiner is using conclusory reasoning in combining Monro with Yoneda. In other words, the Examiner has not as yet provided a sufficient reason or explicit analysis of why the disclosures of the references of Monro and Yoneda should be combined. The combination applied against the claims appears to be a classic case of hindsight reasoning. There is simply no suggestion to combine the teachings and suggestions of Monro and Yoneda as advanced by the Examiner, except from using the subject application as a template through a hindsight reconstruction of each of the pending claims. As *KSR* made clear, rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.

The indication that one would modify the teachings of Yoneda with the teachings of Monro in order to improve the efficiency of such heat generators and for better utilization of heat produced in a thermal section is entirely conclusory. The Applicants respectfully submit that the Examiner has as yet not adequately provided a sufficient reason or explicit analysis of why the disclosures of Monro and Yoneda should be combined.

Accordingly, for all the foregoing reasons, it is respectfully submitted that claim 1

and claim 2 dependent therefrom are in condition for allowance.

Amended **Claim 3** reads: (NEED TO INSERT AMENDED CLAIM 3)

An exhaust smoke processing system comprising an air preheater for heating combustion air by exhaust smoke discharged from a boiler, a dust collector for collecting soot and dust in exhaust smoke discharged from the air preheater, and a wet-type exhaust smoke processing apparatus for wet-type processing exhaust smoke discharged from the dust collector, wherein the system further comprises control means which measures a heavy metal concentration in exhaust smoke discharged from the wet-type exhaust smoke processing apparatus, and which adjusts any one or more of pH of liquid absorbent of the wet-type exhaust smoke processing apparatus, a flow rate of oxidizing-air, and a flow rate of waste water, such that the heavy metal concentration falls within a predetermined range.

Yoneda and Monro do not disclose nor suggest any means for measuring a mercury concentration in an exhaust gas that is discharged from the wet-type exhaust smoke processing, and adjusting any one or more of pH of liquid absorbent of the wet-type exhaust smoke processing apparatus, a flow rate of oxidizing-air, and a flow rate of waste water, such that the mercury concentration in the exhaust gas falls within a predetermined range. Accordingly, in addition to challenging the combination of Yoneda and Monro as improper, Applicant respectfully submits that the combination fails to teach or suggest all the limitations of claim 3. To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. MPEP § 2143.03 For at least these reasons, claim 3 should be allowed.

Amended **Claim 4** reads: (NEED TO INSERT AMENDED CLAIM 4)

An exhaust smoke processing system comprising an air preheater for heating combustion air by exhaust smoke discharged from a boiler, a heat recoverer for heating a heat medium by exhaust smoke discharged from the air preheater, a dust collector for collecting soot and dust in exhaust smoke discharged from the heat recoverer, a wet-type exhaust smoke processing apparatus for wet-type processing exhaust smoke discharged from the dust collector, a reheater for heating exhaust smoke discharged from the wet-type exhaust smoke processing apparatus by

the heat medium, and a heat medium circulation pipe passage for circulating the heat medium between the reheater and the heat recoverer, wherein the system further comprises control means which measures a heavy metal concentration in exhaust smoke discharged from the dust collector, and adjusts the temperature of exhaust smoke at an outlet of the heat recoverer such that the heavy metal concentration falls within a predetermined range, and which also measures the heavy metal concentration in exhaust smoke discharged from the wet-type exhaust smoke processing apparatus, and adjusts any one or more of pH of liquid absorbent of the wet-type exhaust smoke processing apparatus, a flow rate of oxidizing-air, and a flow rate of waste water, such that the heavy metal concentration falls within a predetermined range.

Yoneda and Monro do not disclose nor suggest many of the limitations of amended claim 4, such as

- (i) "control means which measures a mercury concentration in exhaust smoke discharged from the dust collector";
- (ii) "adjusts the temperature of exhaust smoke at an outlet of the heat recoverer such that the mercury concentration falls within a predetermined range";
- (iii) "measures the mercury concentration in exhaust smoke discharged from the wet-type exhaust smoke processing apparatus"; and
- (iv) "adjusts any one or more of pH of liquid absorbent of the wet-type exhaust smoke processing apparatus, a flow rate of oxidizing-air, and a flow rate of waste water, such that the mercury concentration falls within a predetermined range".

Accordingly, Applicant respectfully submits that claim 4 is allowable because the applied combination fails to disclose or fairly suggest all the limitations of claim 4.

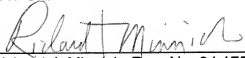
CONCLUSION

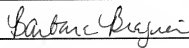
All formal and informal matters having been addressed, it is respectfully submitted that this application is in condition for allowance. If the Examiner is of the view that all of the pending claims of the application are not in clear condition for allowance, it is requested that the Examiner telephone the undersigned for purposes of conducting a telephone interview to resolve any differences. Accordingly, an early notice of allowance is earnestly solicited.

Respectfully submitted,

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August 12, 2008
Date


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